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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Frederick David Gray, et al.	§	Confirmation No.:	7169
		§		
Serial No.:	10/672,045	§	Group Art Unit:	3672
		§		
Filed:	September 26, 2003	§	Examiner:	UNKNOWN
		§		
For:	Reservoir Fracture Characterization	§	Atty. Docket No.:	1780-03601
		§		

**PETITION AND FEE FOR FILING ON BEHALF
OF NON-SIGNING INVENTOR (37 C.F.R. 1.47)**

Atty. Dkt. No.: 1780-03601
Date: February 17, 2004

Mail Stop Missing Parts
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

Frederick David Gray, Dragana Todorovic-Marinic, and Sean T. Boerner, three of the four inventors in the present application, have assigned their rights to Veritas, as evidenced by the Assignment filed with the initial application and recorded in the Patent and Trademark Office. Veritas hereby petitions that the previously filed Declaration be accepted on behalf of the non-signing inventor pursuant to 37 CFR §1.47(b). A *Statement of Facts in Support of Filing on Behalf of Nonsigning Inventor* is attached.

Please charge Deposit Account No. 03-2769 for any fees with respect to this petition.

Respectfully submitted,

Daniel J. Krueger
Reg. No. 42,771
CONLEY ROSE, P.C.
P.O. Box 3267
Houston, Texas 77253-3267
(713) 238-8000
AGENT FOR APPLICANT

02/25/2004 HBERHE 00000110 032769 10672045
02 FC:1460 130.00 DA



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Frederick David Gray, et al.	§	Confirmation No.:	7169
		§		
Serial No.:	10/672,045	§	Group Art Unit:	3672
		§		
Filed:	September 26, 2003	§	Examiner:	UNKNOWN
		§		
For:	Reservoir Fracture	§	Atty. Docket No.:	1780-03601
	Characterization	§		

**STATEMENT OF FACTS IN SUPPORT OF FILING
ON BEHALF OF NONSIGNING INVENTOR (37 CFR 1.47)**

Date: February 17, 2004

Mail Stop Missing Parts
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This statement is made as to the facts that are relied upon to establish the diligent effort made to secure the execution of the declaration by a nonsigning inventor for the above identified patent application before deposit thereof in the U.S. Patent and Trademark Office.

A. Current Address of the Non-Signing Inventor, Abdel M. Zellou

Abdel M. Zellou
13 Rue Pierre Loti
Bourg La Reine, France 92340
Phone: 011 33 14 350 0641

B. Identification of Person Making this Statement of Facts

Daniel J. Krueger
PTO Reg. No. 42,771
CONLEY ROSE, PC
P.O. Box 3276
Houston, Texas 77253-3276
AGENT FOR APPLICANT

C. Statement of Pertinent Facts as Required by 37 CFR 1.47

1. Mr. Zellou acknowledged receiving an initial draft of the non-provisional patent application on June 27, 2003. See Exhibit A.

2. By a phone conversation with Mr. Zellou on September 17, 2003, we learned that Mr. Zellou was no longer employed at Veritas. We confirmed that Mr. Zellou had received a revised draft of the application and that he had no comments on the draft.

3. Mr. Zellou received a final draft of the non-provisional patent application that was sent on September 23, 2003. The final draft was accompanied by a Declaration and an Assignment. See Exhibit B. (Receipt was acknowledged in Exhibit C).

4. Subsequent phone conversations ensued concerning ownership rights in the non-provisional patent application. In each of these communications, Mr. Zellou resisted signing the Declaration. See Exhibit C.

5. On January 21, 2004 a letter was sent to Mr. Zellou via Federal Express, item number 791124687870, containing a copy of the filed application as filed on September 26, 2003, and a Declaration and Assignment to be executed. Exhibit D.

6. Delivery Status from Federal Express indicates that item number 791124687870 was delivered at 10:35 a.m. on January 23, 2004 in Bourg-La-Reine, France, and the item was signed for by A. Zellou. Exhibit E.

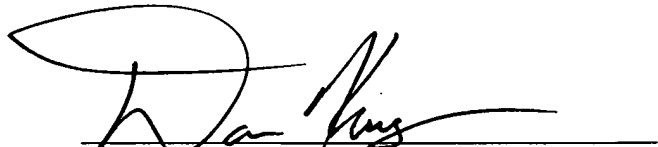
7. By facsimile dated February 11, 2004, Mr. Zellou acknowledged receipt of the Federal Express letter, and indicated that he would not sign the Declaration or Assignment. See Exhibit F.

8. Mr. Zellou has failed to execute and return a signed Declaration or Assignment after these repeated attempts.

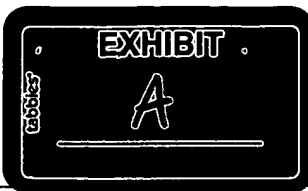
9. Veritas is the assignee of the rights of the other three inventors in this case. See Exhibit G.

10. Veritas seeks patent protection to protect Veritas's rights in the claimed invention and the rights (if any) of the non-signing inventor.

Date: February 17, 2004



Daniel J. Krueger
PTO Reg. No. 42,771
CONLEY ROSE, PC
P.O. Box 3276
Houston, Texas 77253-3276
AGENT FOR APPLICANT



Jennifer Ringer

From: Jennifer Ringer
Sent: Friday, June 27, 2003 9:15 AM
To: 'abdel zellou'
Cc: Dan Krueger; 'kathy_sostak@veritasdgc.com'
Subject: RE: Veritas Ref: ??? INITIAL DRAFT PATENT APPLICATION Our Ref: 1780-03601

Thank you very much Mr. Zellou, and again please feel free to contact me if I may be of any assistance to you.

Regards,

Jennifer Ringer
Legal Assistant to Daniel J. Krueger, Ph.D.
CONLEY ROSE, P.C.
600 Travis Street, Suite 7100
Houston, Texas 77002
voice: 713.227.7153
fax: 713.238.8008

-----Original Message-----

From: abdel zellou [mailto:azellou@hotmail.com]
Sent: Friday, June 27, 2003 7:30 AM
To: jringer@conleyrose.com
Subject: Re: Veritas Ref: ??? INITIAL DRAFT PATENT APPLICATION Our Ref: 1780-03601

Ms. Ringer,

I did receive your documents and manage to open them. I will get back to you if I have any comments, modifications, additions to those documents.

Regards,

Abdel M. Zellou

>From: Jennifer Ringer
>To: "'azellou@hotmail.com'"
>Subject: Veritas Ref: ??? INITIAL DRAFT PATENT APPLICATION Our Ref: 1780-03601
>Date: Thu, 26 Jun 2003 13:40:49 -0500
>
>Mr. Zellou: Please contact me if you have difficulty accessing the attached
>documents.
>
>
>Regards,

6/27/2003

>

>

>Jennifer Ringer

>Legal Assistant to Jonathan M. Harris, Esq.

>CONLEY ROSE, P.C.

>600 Travis Street, Suite 7100

>Houston, Texas 77002

>voice: 713.227.7153

>fax: 713.238.8008

>

>

>>-----Original Message-----

>>From: Jennifer Ringer

>>Sent: Wednesday, June 25, 2003 4:32 PM

>>To: 'dave_gray@veritasdgc.com';

>>'dragana_todorovic-marinic@veritasdgc.com'; 'sean_boerner@veritasdgc.com'

>>Cc: 'Brent_Whiteley@veritasdgc.com'; 'Kathy_Sostak@veritasdgc.com'; Dan

>>Krueger

>>Subject: Veritas Ref: ??? INITIAL DRAFT PATENT APPLICATION Our

>>Ref: 1780-03601

>>

>><><>> 1780-03601.doc>>

>>

>>U.S. Utility Patent Application

>>Entitled: Integrated Fractured Reservoir Characterization

>>Inventors: Dave F. Gray, Abdel M. Zellou, Dragana

>>Todorovic-Marinic, and Sean Boerner

>>Veritas Docket No.: ???

>>Our Docket No.: 1780-03601

>>

>>Dear Inventors:

>>

>> Attached is the initial draft of a patent application for the
 >> above-identified invention. Please read the application over carefully,
 >> checking it against the drawings. Please be sure that the best mode of
 >> making and using the invention is completely and accurately described in
 >> the application. Please review the claims so that we can be sure that they
 >> accurately and fully define the proper scope of the invention.

>>

>> A careful review of the application now will pay dividends in the future.
 >> After you have completed your review, please provide Dan Krueger with your
 >> comments by return email dkrueger@conleyrose.com), orally (713-238-8055),
 >> or in writing, as soon as reasonably possible, but preferably by June 30,
 >> 2003. You may use "track changes" when making revisions to the
 >> application.

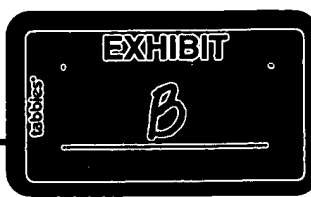
>>

>> Also, please review your name, address and citizenship status on the cover
 >> page of the application and let us know if any of the information is
 >> incorrect.

>>

>> We look forward to receiving your comments.

Jennifer Ringer



From: Jennifer Ringer
Sent: Tuesday, September 23, 2003 9:28 AM
To: 'azellou@netscape.net'
Cc: Dan Krueger
Subject: FW: FINAL DRAFT & FORMAL DOCUMENTS for Reservoir Fractured Characterization (1780-03601)

Mr. Zellou: attached please find the formal documents for your signature, please contact me if you have any questions . Thanks!

Jennifer Ringer
CONLEY ROSE, P.C.
600 Travis Street, Suite 7100
Houston, Texas 77002
voice: 713.227.7153
fax: 713.238.8008

-----Original Message-----

From: Jennifer Ringer
Sent: Sunday, September 07, 2003 10:19 AM
To: 'azellou@hotmail.com'; 'dave_gray@veritasdgc.com'; 'dragana_todorovic-marinic@veritasdgc.com'; 'sean_boerner@veritasdgc.com'
Cc: 'Brent_Whiteley@veritasdgc.com'; Dan Krueger; 'Kathy_Sostak@veritasdgc.com'
Subject: FINAL DRAFT & FORMAL DOCUMENTS for Reservoir Fractured Characterization (1780-03601)



ASSIGNMENT
1780-03601.doc



DECLARATION
1780-03601.doc



FORMAL
INGS 1780-03601



PATENT
ICATION 1780-0360

U.S. Utility Patent Application

Entitled: Reservoir Fractured Characterization
Inventors: Dave F. Gray, Abdel M. Zellou, Dragana Todorovic-Marinic, and Sean Boerner
Atty Docket No.: 1780-03601

Dear Inventors:

Attached is the final draft of the above-identified U.S. patent application along with a Declaration and Assignment. Please review the attached patent application and if everything is in order, sign and date the Declaration and Assignment and return them to us VIA FAX by September 12, 2003 (713.238.8008) and thereafter via First Class U.S. Mail/International courier so that we may file the application before the bar date of September 27, 2003. Note that the Assignment should be notarized.

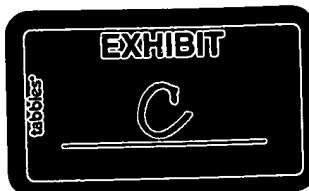
Should you have any questions, please do not hesitate to call Daniel J. Krueger at (713) 238-8055.

Regards,

Jennifer Ringer
Legal Assistant to Daniel J. Krueger, Ph.D.
CONLEY ROSE, P.C.
600 Travis Street, Suite 7100
Houston, Texas 77002
voice: 713.227.7153

fax: 713.238.8008

Abdel M. Zellou
13 Rue Pierre Loti
92340 Bourg-La-Reine
fax: 01-47-02-72-71

**Fax**

To:	Dan Krueger	From:	Abdel Zellou
Fax:	1-713-238-8008	Pages:	1 / 3
Phone:	1-713-238-8055	Date:	9/28/2003
Re:	Follow up on signature of the declaration of invention and copy of RC2 contract CC: Jennifer Ringer		
<input type="checkbox"/> Urgent <input type="checkbox"/> For Review <input type="checkbox"/> Please Comment <input type="checkbox"/> Please Reply <input type="checkbox"/> Please Recycle			

Mr. Krueger:

Following our phone conversation dated Monday Sept. 22nd 2003 and you e-mail dated Tuesday Sept. 23rd 2003, you will find attached to this fax:

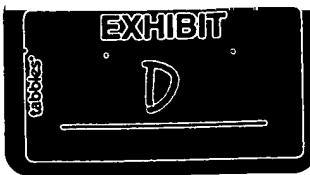
- a copy of my RC^2 contract

Regarding the signature of the declaration of invention for the "Reservoir Fracture Characterization", I am still seeking legal advice before returning this document to you. As I mentioned to you on the phone, I am not being uncooperative, but just seeking advice.

Best regards,

A handwritten signature in black ink, appearing to be "Abdel Zellou".

Abdel ZELLOU



CONLEY ROSE

A PROFESSIONAL CORPORATION
JPMORGAN CHASE TOWER
600 TRAVIS, SUITE 7100
HOUSTON, TEXAS 77002-2912
TELEPHONE: (713) 238-8000
FACSIMILE: (713) 238-8008

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AUSTIN OFFICE
(512) 476-1400

DALLAS OFFICE
(972) 731-2288

DANIEL J. KRUEGER, PH.D.
Patent Agent

Direct Dial No.: (713) 238-8055
E-Mail: DKrueger@conleyrose.com

January 21, 2004

VIA FEDERAL EXPRESS

Mr. Abdel M. Zellou
13 Rue Pierre Loti
92340 Bourg-La-Reine
France

**PRIVILEGED AND CONFIDENTIAL
ATTORNEY/CLIENT COMMUNICATION**

Re: U.S. Patent Application
Entitled: Reservoir Fracture Characterization
Filing Date: September 26, 2003
Serial No.: 10/672,045
Our Ref. No.: 1780-03601

Dear Mr. Zellou:

Because the above-captioned patent application was filed without the signature of the inventors, we have received a Notice of Missing Parts from the PTO. Therefore, a *Declaration* is enclosed, along with an *Assignment* from you to *Veritas DGC Inc.*. A copy of the application as filed and to which this Declaration relates is enclosed.

Please sign both the *Assignment* and the *Declaration* where indicated, have your signature on the *Assignment* notarized and return both documents to me for filing with the U.S. Patent and Trademark Office prior to February 18, 2004.

We look forward to hearing from you on your decision whether or not to pursue this application.

Very truly yours,

A handwritten signature in black ink, appearing to read "Dan Krueger".

Daniel J. Krueger, Ph.D.

DJK:jr
Encls.

cc: Brent N. Whiteley, Esq. (w/out Encls., via First Class U.S. Mail)

118170.01/1780.03601

Orig. ID: WHTA
 From: JENNIFER JR RINGER (713) 227-7153
 CONLEY ROSE, P.C.
 600 TRAVIS, SUITE 7100

HOUSTON
 TX 77002 (US)

NDR30.55(h)



To: Abdel M. Zellou 0113314350

13 Rue Pierre Loti

IRS/EIN:
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Bourg-La-Reine 92340 FRANCE (FR)

Description
 patent documents

Country Mfg.

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 BILL D/T: C

Ref:
 Signature: JENNIFER JR RINGER

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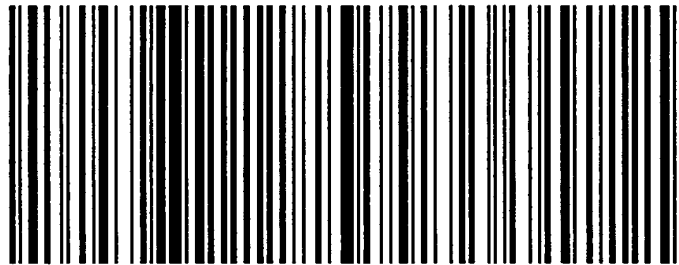
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Refer to the Convention to determine the claims period for your shipment. The right to damages against us shall be extinguished unless an action is brought within two years, as set forth in the Convention. FedEx is not obligated to act on any claim until all transportation charges have been paid. The claim amount may not be deducted from the transportation charges. If the recipient accepts the shipment without noting any damage on the delivery record, FedEx will assume the shipment was delivered in good condition. In order for us to consider a claim for damage, the contents, original shipping carton and packing must be made available to us for inspection. **MANDATORY LAW.** Insofar as any provision contained referred to in this Air Waybill may be contrary to any applicable international treaties, laws, government regulations, orders or requirements such provisions shall remain in effect as a part of our agreement to the extent that it is not overridden. The invalidity or unenforceability of any provisions shall not affect any other part of this Air Waybill. Unless otherwise indicated, **FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue Memphis, TN 38132, USA,** is the first carrier of this shipment. Email address located at www.fedex.com.

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Ship date	Jan 21, 2004	Service type	Priority Envelope
Delivery date/Time	Jan 23, 2004 10:35 am		

Date/Time	Status	Location	Comments
Jan 23, 2004	10:35 am Delivered	BOURG-LA-REINE FR	
	5:13 am Package status	GENNEVILLIERS FR	
	5:13 am On FedEx vehicle for delivery	GENNEVILLIERS FR	
	5:13 am Arrived at FedEx Destination Location	GENNEVILLIERS FR	
Jan 22, 2004	10:30 pm Left FedEx Sort Facility	PARIS FR	
	9:38 pm Package status	PARIS FR	Package available for clearance
	9:38 pm Package status	PARIS FR	Released for Delivery
	9:38 pm Arrived at Sort Facility	PARIS FR	
	4:41 pm Arrived at FedEx Ramp	ROISSY FR	
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13 Rue Pierre Loti
92340 Bourg La Reine
France

February 12, 2004

RE: U.S. Patent Application
Entitled: Reservoir Fracture Characterization
Filing Date: September 26, 2003
Serial Number: 10/672,045

VIA FACSIMILE

Daniel J. Krueger
Conley Rose
JP Morgan Chase Tower
600 Travis, suite 700
Houston, TEXAS 77002-2912
USA

Dear Daniel J. Krueger:

I acknowledge that I have received via Fedex the declaration and assignment that you have requested that I sign for submission to the Patent Office.

After seeking legal advice, I want to let you know that I am in no way obligated to sign the assignment, since I have not signed the new employment contract after the acquisition of RC Squared by Veritas DGC. I have already submitted to you the contract I signed with RC Squared and there is no mention of duties related to intellectual property. Furthermore, the scope of my employment was limited to performing consulting services and "hired-to-invent" exception does not apply in my case.

I also would like to make sure that all the relevant prior art publications (e.g., SPE 30572, SPE 30722, SPE 39965, SPE 65118, Journal of Petroleum Geology (vol. 4 (4), Oct. 2001), Computers and Geoscience, 26, 2000 p. 953-962) have been submitted to the Patent Office. I have attached an annotated list of the claims in the patent application showing the relevance of this prior art to each claim. As you can see, virtually all of the claims are barred by this prior art. Therefore, I cannot sign the declaration in good faith.

I look forward to hearing from you.

Best regards,

A handwritten signature in black ink, appearing to read "Abdel M. Zellou".
Abdel M. Zellou
Enclosure (6 pages)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

AN APPLICATION FOR UNITED STATES LETTERS PATENT ON:

RESERVOIR FRACTURE CHARACTERIZATION

By:

**Frederick David Gray
428 Parkvalley Dr. SE
Calgary, AB Canada T2J 4V4
Citizenship: Canada**

**Abdel M. Zellou
13 Rue Pierre Loti
Bourg La Reine, France 92340
Citizenship: France**

**Dragana Todorovic-Marinic
107 Strathcona Mews SW
Calgary, AB Canada T3H 1W2
Citizenship: Canada**

**Sean Boerner
13907 Wetherfield Lane
Cypress, TX 77429
Citizenship: US**

Claims

What is claimed is:

1. A method of reservoir fracture characterization, the method comprising:
obtaining seismic traces;
combining seismic traces into gathers that reveal acoustic reflectivity as a function of offset, azimuth, and position;
measuring reflection anisotropy as a function of position;
determining a relationship between reflection anisotropy and fracture intensity measurements at specific positions; and **(This claim has already been published See SPE papers 30572 and 30722)**

applying the relationship to reflection anisotropy measurements to create a set of fracture intensity measurements at regularly-spaced positions. **(This claim has already been published See papers 30572 and 30722)**
2. The method of claim 1, wherein the specific positions are locations of preexisting wells.
(This claim has already been published See papers 30572 and 30722)
3. The method of claim 2, wherein the fracture intensity measurements take form as a production measure. **(This claim has already been published See SPE 39965)**
4. The method of claim 3, wherein the production measure is a four month cumulative fluid production.
5. The method of claim 1, wherein said determining a relationship includes using multiple regression to identify a statistical dependence of the fracture intensity measurement on reflection anisotropy. **(This claim has already been published See SPE papers 30572, 30722, 39965,**

65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001, Computer and Geoscience, 26, 2000 p. 953-962)

6. The method of claim 1, wherein said determining a relationship includes training a neural network to predict a fracture intensity measurement in response to a set of input values, the set including reflection anisotropy. **(This claim has already been published Computer and Geoscience, 26, 2000 p. 953-962)**

7. The method of claim 1, further comprising:

displaying the set of fracture intensity measurements as function of two spatial dimensions.

(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)

8. The method of claim 7, wherein the set of fracture intensity measurements is displayed as a map. **(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)**

9. The method of claim 1, further comprising:

displaying the set of fracture intensity measurements as a function of three spatial dimensions.

(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)

10. The method of claim 1, further comprising:

correlating a set of seismic attributes with the fracture intensity measurements at specific

positions, wherein the set of seismic attributes includes reflection anisotropy,

wherein said determining a relationship between reflection anisotropy and fracture intensity measurements further includes determining a relationship between fracture intensity and those seismic attributes that are well-correlated with the fracture intensity measurements.

(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)

11. The method of claim 10, wherein said correlating is performed using a rank-correlation technique.

(This claim has already been published Computer and Geoscience, 26, 2000 p. 953-962)

12. A system for reservoir fracture characterization, the system comprising:

an information storage device having seismic traces; and

a processor configured to retrieve and process the seismic traces to determine an array of reflection anisotropy values,

wherein the processor is further configured to determine a relationship between reflection anisotropy and a measure of fracture intensity at one or more well positions.

(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)

13. The system of claim 12, wherein the measure of fracture intensity relates to fluid production from wells at the one or more well positions. **(This claim has already been published See SPE paper 39965)**

14. The system of claim 12, wherein the measure of fracture intensity is a four month cumulative fluid production.

15. The system of claim 12, wherein the processor is configured to determine said relationship using multiple regression.

(This claim has already been published Computer and Geoscience, 26, 2000 p. 953-962)

16. The system of claim 12, wherein the processor is configured to determine said relationship by training one or more neural networks. **(This claim has already been published Computer and Geoscience, 26, 2000 p. 953-962)**

17. The system of claim 12, further comprising:

a graphical display coupled to the processor and configured to present a view of fracture intensity measurements as a function of position, wherein the processor is configured to generate said view by applying said relationship to an array of reflection anisotropy values. **(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)**

18. The system of claim 17, wherein the display presents fracture intensity measurements as a function of two spatial dimensions. **(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)**

19. The system of claim 17, wherein the display presents fracture intensity measurements as a function of three spatial dimensions.

(This claim has already been published See SPE papers 30572, 30722, 39965, 65118, Journal of petroleum geology (vol 4 (4)), Oct. 2001)

Abstract

Systems and methods of reservoir fracture characterization are disclosed. In one embodiment, the method comprises: 1) obtaining seismic traces; 2) combining seismic traces into gathers that reveal acoustic reflectivity as a function of offset, azimuth, and position; 3) measuring reflection anisotropy as a function of position; 4) determining a relationship between reflection anisotropy and fracture intensity measurements at specific positions; and 5) applying the relationship to reflection anisotropy measurements to create a set of fracture intensity measurements at regularly-spaced positions.



Attorney Docket No. 1780-03601
Express Mail Label No. EV303484941US

ASSIGNMENT

IN CONSIDERATION OF TEN DOLLARS (\$10.00) cash in hand paid to us by **VERITAS DGC INC.**, and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, we, **Frederick David GRAY, Abdel M. ZELLOU, Dragana TODOROVIC-MARINIC, and Sean T. BOERNER** ("ASSIGNORS"), having made an invention in "**RESERVOIR FRACTURE CHARACTERIZATION**", while in the employ either as an employee or consultant of **VERITAS DGC INC.**, a corporation organized and existing under the laws of the State of Delaware, doing business at 10300 Town Park, Houston, Texas 77072 (sometimes hereinafter called "ASSIGNEE"), do hereby ASSIGN, SELL and CONVEY to said **VERITAS DGC INC.** its successors and assigns, the entire right, title and interest throughout the world in and to:

1. Said invention in in "**RESERVOIR FRACTURE CHARACTERIZATION**";
2. United States of America patent application on said invention, filed concurrently herewith or as U.S. Patent Application No. _____ filed _____ 2003 (Attorney's File No. 1780-03601; attorney is authorized to fill in the application number and filing date after assignment by the U.S. Patent and Trademark Office), entitled "**RESERVOIR FRACTURE CHARACTERIZATION**";
3. All applications for patent or like protection on said invention that have now been or may in the future be made by us or our legal representatives, including any continuation, continuation-in-part and any other utility applications that may be based on this invention, whether in the United States of America or any other place anywhere in the world;
4. All patents and like protection that have now been or may in the future be granted on said invention to us or our legal representatives, whether in the United States of America or in any other country or place anywhere in the world;
5. All substitutions for and divisions, continuations, continuations-in-part, renewals, reissues, extensions, and the like of said applications and patents and like grants, including without limitation, those

obtained or permissible under past, present and future laws and statutes;

6. All rights of action on account of past, present and future unauthorized use of said invention and for infringement of said patents and like protection;
7. The right in ASSIGNEE to file in its name applications for patents and like protection for said invention in any country or countries foreign to the United States; and
8. All international rights of priority associated with said invention, applications, patents and like protection;

and we covenant that we, and our heirs, legal representatives, assigns, administrators, and executors, will, at the expense of ASSIGNEE, its successors and assigns, execute all papers and perform such other acts as may be reasonably necessary to give ASSIGNEE, its successors and assigns, the full benefit of this Assignment.

EXECUTED at the place and on the date indicated below, opposite our signatures.

ASSIGNORS

Date: Sept 25 103.

F. David Gray
Frederick David GRAY

Executed at: CALGARY AB.

Province of
THE STATE OF AB §

COUNTY OF CANADA §

BEFORE ME, the undersigned authority, on this day personally appeared Frederick David GRAY, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 25 day of September, 2003.

[SEAL]

My Commission Expires:

Sylvia Ann Wickham
Notary Public in and for the Province of
Alberta
the State of AB

SYLVIA ANN WICKHAM
My Appointment Expires December 31, 2005

Date: _____

UNSIGNED

Abdel M. ZELLOU

Executed at: _____

THE STATE OF _____ §

COUNTY OF _____ §

BEFORE ME, the undersigned authority, on this day personally appeared **Abdel M. ZELLOU**, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the _____ day of _____, 2003

[S E A L]

Notary Public in and for
the State of _____

My Commission Expires:

Date: Sept 25 / 03.

Dragana TODOROVIC-MARINIC
Dragana TODOROVIC-MARINIC

Executed at: CALGARY

Dist Province SW
THE STATE OF AB §

COUNTY OF CANADA §

BEFORE ME, the undersigned authority, on this day personally appeared **Dragana TODOROVIC-MARINIC**, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 25 day of September, 2003

[S E A L]

Sylvia Ann Wickham
Notary Public in and for the Province
the State of SW of Alberta

My Commission Expires:

SYLVIA ANN WICKHAM
My Appointment Expires December 31, 2005

Date: September 26, 2003

Sean T. Boerner
Sean T. BOERNER

Executed at: Houston

LTB

THE STATE OF Texas §

§

COUNTY OF Harris §

BEFORE ME, the undersigned authority, on this day personally appeared Sean T. BOERNER, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed. LTB

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 24 day of September, 2003

[SEAL] Gladys Berona Reyes
My Commission Expires
May 12, 2004

Gladys Berona Reyes
Notary Public in and for
the State of Texas

May 12, 2004
